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PATENT APPLICATION TRANSMITTAL LETTER
TO THE COMMISSIONER OF PATENTS AND TRADEMARKS

DOCKET NO. 1966

Transmitted for filing is the patent application of _____ for
GARY E. GAUMER, BRUCE A. SPIELHOLZ
"BIOCIDE COMPOSITION CONTAINING PROPIONIC ACID AND IODINE COMPOUNDS"

Enclosed are:

_____ sheets of drawings.
XXXX an assignment of the invention to PRESERVE INTERNATIONAL
a certified copy of a _____

_____ associate power of attorney _____

XXXX verified statement to establish small entity status under
37 C.F.R. 1.9 and 1.27.

CLAIMS AS FILED

SMALL ENTITY

OTHER THAN
SMALL ENTITY

FOR	NO. FILED *****	NO. EXTRA *****	RATE *****	FEE *****	RATE *****	FEE *****
BASIC FEE	*****	*****	*****	\$345	*****	\$690
TOTAL CLAIMS	41 - 20	21	X \$9	= \$ 189	X \$18	= \$ 0
INDEP CLAIMS	10 - 3	0	X \$39	= \$ 273	X \$78	= \$ 0
MULTIPLE INDEPENDENT CLAIMS	0		+\$130	= \$ 0	+260	= \$ 0
				TOTAL = \$ 807	TOTAL = \$ 0	

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_____ Any filing fees under 37 C.F.R. 1.16 for presentation of extra claims.

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_____ The issue fee set in 37 C.F.R. 1.18 at or before mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).

March 21, 2000
DATE

Willie Krawitz
WILLIE KRAWITZ - REG. NO.: 20,782

Applicant or Patentee : GARY E. GAUMER, BRUCE A. SPIELHOLZ
Serial or Patent No. :
Filed or issued : DOCKET: 1966
For : "BIOCIDE COMPOSITION CONTAINING
PROPIONIC ACID AND IODINE COMPOUNDS"

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS

[37 C.F.R. 1.9 (f) and 1.27 (b)] - INDEPENDENT INVENTOR

As below named inventor, I hereby declare that I qualify as independent inventor as defined in 37 C.F.R. 1.9 (c) for purposes of paying reduced fees under section 41 (a) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled

"BIOCIDE COMPOSITION CONTAINING
PROPIONIC ACID AND IODINE COMPOUNDS"

described in:

[XXXXXX] the specification filed herewith
[] application serial no. _____, filed _____
[] patent no. _____, issued _____

We have not assigned, granted, conveyed or licensed and are under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 C.F.R. 1.9 (c) if that person had made the invention, or in any concern which would not qualify as a small business concern, under 37 C.F.R. 1.9 (d) or a nonprofit organization under 37 C.F.R. 1.9 (e).

Each person, concern or organization to which we have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any right in the invention are listed below.

[] no such person, concern, or organization
[XXXXXX] persons, concerns or organizations listed below***

***NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities [37 C.F.R. 1.27].

FULL NAME PRESERVE INTERNATIONAL

ADDRESS 336 BROADWAY, SUITE 18 CHICO, CALIFORNIA 95928

[] individual [XXX] small business concern [] nonprofit organization

FULL NAME

ADDRESS

[] individual [] small business concern [] nonprofit organization

FULL NAME

ADDRESS

[] individual [] small business concern [] nonprofit organization

We acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate [37 C.F.R. 1.28 (b)].

We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18 section 1001 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

GARY E. GAUMER
NAME OF INVENTOR

BRUCE A. SPIELHOLZ
NAME OF INVENTOR

NAME OF INVENTOR

INVENTOR'S SIGNATURE

INVENTOR'S SIGNATURE

INVENTOR'S SIGNATURE

DATE

DATE

DATE

Applicant or Patentee: PRESERVE INTERNATIONAL
Serial or Patent No: _____ Docket No.: 1966
Filed or Issued: _____
For: "BIOCIDE COMPOSITION CONTAINING
PROPRIONIC ACID AND IODINE COMPOUNDS"

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY STATUS
(37 C.F.R. 1.9 (f) and 1.27 (c) - SMALL BUSINESS CONCERN)

I hereby declare that I am
[] the owner of the small business concern identified below:
[XXX] an official of the small business concern empowered to act on behalf of
the concern identified below:

NAME OF CONCERN PRESERVE INTERNATIONAL
ADDRESS OF CONCERN 336 BROADWAY, SUITE 18
CHICO, CALIFORNIA 95928

I hereby declare that the above identified small business concern qualifies as a small business concern as defined in 13 C.F.R. 121.3-18, and reproduced in 37 C.F.R. 1.9 (d), for purposes of paying reduced fees under sections 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 persons. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the persons employed on a full-time, part-time, or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to and remain with the small business concern identified above with regard to the invention, entitled "BIOCIDE COMPOSITION CONTAINING
PROPRIONIC ACID AND IODINE COMPOUNDS"

by inventor(s) GARY E. GAUMER, BRUCE A. SPIELHOLZ
described in

[XXXX] the specification filed herewith
application serial no. _____, filed _____
patent no. _____, issued _____

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having rights to the invention is listed below***, and no other rights to the invention are held by any person, other than the inventor, who could not qualify as a small business concern under 37 C.F.R. 1.9 (d) or by any concern which would not qualify as a small business concern under 37 C.F.R. 1.9 (d) or a nonprofit organization under 37 C.F.R. 1.9 (e). ***NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 C.F.R. 1.27)

NAME PRESERVE INTERNATIONAL
ADDRESS 336 BROADWAY, SUITE 18
CHICO, CALIFORNIA 95928

[] individual [XXXX] small business concern [] nonprofit organization

NAME _____
ADDRESS _____

[] individual [] small business concern [] nonprofit organization

I acknowledge my duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. 1.28 (b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

NAME OF PERSON SIGNING GARY E. GAUMER
TITLE OF PERSON OTHER THAN OWNER PRESIDENT
ADDRESS OF PERSON SIGNING 336 BROADWAY, SUITE 18
CHICO, CALIFORNIA 95928

SIGNATURE [Signature] DATE 3/8/00

1 BACKGROUND OF THE INVENTION:

2 This invention relates to a new and improved, biodegradable
3 biocide composition having mold inhibiting or prevention activity
4 and which provides both long and short term activity in animal
5 husbandry use, and for the medical and food industry, and the
6 like. The present biocide composition retains activity in the
7 presence of significant amounts of organic matter and hard water,
8 and provides an activity having a short inception time, and for
9 a significant period thereafter; also, the shelf life of the
10 present composition has a significant shelf life.

11
12 Biocides for use particularly in animal husbandry locations,
13 and the like, require a suitable activity against a wide variety
14 of microorganisms such as bacteria, molds, spores and viruses,
15 and in the presence of significant amounts of organic matter and
16 using hard water. Additionally, this activity should have a
17 short inception period such as ten minutes, and be effective for
18 a significant period of time thereafter, such as for at least
19 five hours. Also, these biocides should be capable of being used
20 not only for spraying onto surfaces, but also to inhibit or
21 remove airborne contamination, particularly in poultry houses,
22 where dust and airborne particles may carry many types of
23 diseases. Also, biocides generally should be biodegradable, and
24 possess a long shelf life yielding phase and composition
25 stability such as about twelve to eighteen months.

26
27 Many biocides are well known, and publications of these
28 types are found in U.S. Patents 3,028,299; 3,150,096; 3,367,877;
29 3,438,905; 3,644,650; 3,697,651; 3,728,449; 4,059,615; 4,107,312;
30 4,226,866; 4,923,899; 4,957,912; 4,983,635; 5,030,659; 5,124,359;
31 5,284,875; 5,344,838; 5,338,748; 5,368,868; 5,391,379; 5,419,908;
32 5,500,138; 5,668,102; 5,891,922 and, French Patent 2,622,397.

1 U.S. Patents 5,338,748 and 5,344,838 both disclose using
2 arsenic, chromium, cyanides, lead and selenium in the intended
3 compounds, which would make them totally unsuitable for animal
4 husbandry purposes. Hence, it is considered these patents do not
5 describe a combination of the desired properties of a biocide
6 composition for the intended usage. U.S. Patents 3,728,449 and
7 5,368,868 describe the use of iodine, propylene glycol and a
8 block copolymer of polyoxyethylene and polyoxypropylene as a
9 germicidal composition, but they are used as a bovine teat dip,
10 and are too mild as a biocide in an animal husbandry environment.

11

12 **THE INVENTION:**

13 According to the invention, a biocide composition is
14 provided comprising, propionic acid and iodine (I or I^-) or an
15 iodine containing compound such as hydriodic acid (HI^-) or
16 equivalent such as NaI , KI , CaI_2 , etc., and iodophors. HI^- is one
17 of the preferred iodine containing compounds since it promotes
18 phase and composition stability, thereby adding about twelve to
19 eighteen months to the shelf life at ambient temperature.

20

21 The propionic acid functions to control pH, and to combine
22 with ambient NH_3 to form ammonium propionate, thereby producing
23 residual biocidal activity, which inhibits or prevents
24 microorganism formation, including mold formation. The
25 composition may have efficacy as a bovine teat dip, either as
26 ammonium propionate and/or as propionic acid with iodine. Other
27 propionates such as butyrates, valerates and isovalerates and
28 their salts (e.g., Ca , Na , K , etc.), esters, etc, may be used.

29

30 Air spraying with minimal or no water, will neutralize or
31 minimize airborne contamination such as dust, organic material
32 and particulates which may harbor airborne diseases. Used in
33 liquid form for spraying onto animal husbandry surfaces, instead
34 of airborne spraying, the iodine containing propionic acid may be
35 mixed with a surfactant to complex or stabilize the iodine.

1 Added materials which may be employed include: water
2 dilution; dust inhibitors such as propylene glycol; and,
3 additional acidifying and buffering agents such as citric,
4 lactic, sorbic, maleic and fumaric acids, and their salts, esters
5 and mixtures thereof. Other stronger acidifying agents such as
6 phosphoric and/or sulfuric acid, and the like may be used for
7 imparting a suitable pH range to the composition of between about
8 -1 to 5, while a narrower, preferred pH range is approximately
9 -1 to 3.

10
11 When used to spray surfaces, a suitable surfactant carrier
12 is a block copolymer of propylene oxide and ethylene oxide such
13 as sold by BASF Corp. under the registered trade marks of
14 PLURONIC[®] and TETRONIC[®]; these copolymers are nonionic, liquid
15 surfactants with an HLB range of about 1.0 - 7.0. Other liquid,
16 anionic, biodegradable surfactants having iodine complexing
17 capability in the same or similar HLB range may be employed, and
18 are found in "McCutcheon's Emulsifiers & Detergents", Vol. 1:
19 1989 to 1999 (incorporated herein, by reference).

20
21 Suitable surfactants are also described in U.S. Patents
22 5,534,266 and 5,720,984 (incorporated herein by reference), the
23 latter patent disclosing a non-ionic, laureth (11 - 16)
24 carboxylic acid surfactant teat dip and hand foam which is highly
25 suitable as the surfactant for use in this invention. Additional
26 publications concerning bovine teat dip formulations are
27 described in U.S. Patents 4,012,504; 4,049,830; 4,759,931;
28 5,529,770; 5,641,498; 5,368,868; 5,616,348; and, 5,651,977.
29 Polyethenoxy detergents and I₂ are disclosed in an article by
30 Benjamin Carroll in the Journal of Bacteriology, 69: 413 - 417,
31 (1955). A PVP surfactant for a teat dip is also suitable, and
32 also one sold by Norman Fox & Co. under the trade name of NORFOX
33 N-P9, and listed in "McCutcheon's Emulsifiers and Detergents
34 1989", specifically for use with iodophors.

35

1 Other types of teat dips are sold as Klenzade™ Teat Guard
2 containing a nonyl phenoxypolyethoxy ethanol surfactant and
3 titratable iodine. U.S. Patent 5,616,348 (supra) discloses a
4 polyethoxylated polyoxypropylene block copolymer (Poloxamer) and
5 iodine, but which does not employ propionic acid.

6
7 U.S. Patent 5,967,202 to Ecolab, Inc. describes the
8 manufacture of bovine teat dips by feeding components from an
9 automatic dispensing apparatus to a milking station. The Ecolab,
10 patent lists a wide variety of medicaments and surfactants which
11 may be used in the manufacture of bovine teat dips, and are
12 incorporated by reference herewith. The Ecolab patent also
13 describes the use of defoaming agents for processing purposes
14 (col. 19), which is distinct from a foam bovine teat dip.

15
16 A broad concentrate composition comprises: iodine: at least
17 about 0.1%; hydriodic acid: at least about 0.01%; propionic acid:
18 at least about 10%; phosphoric acid and/or sulfuric acid, and the
19 like: sufficient to obtain a pH of about -2 to 3; a buffer: at
20 least about 1%; and, a polyhydric alcohol such as propylene
21 glycol, glycerol, mannitol, sorbitol, butylene glycols, and the
22 like: at least about 5%, all parts by weight.

23
24 A narrower, preferred composition comprises: iodine: about
25 0.1% - 5%; hydriodic acid: about 0.01% - 2%; propionic acid, and
26 the like: about 10% - 75%; phosphoric acid, and/or sulfuric acid,
27 and the like: sufficient to obtain a pH of about -2 to 3; a
28 buffer: at least about 1%; and, propylene glycol, and the like:
29 about 5% - 30%, all parts by weight.

1 A coverage of from 2,500 - 30,000 square feet of surface
2 preferably uses 5 - 60 gallons of concentrate for 100 - 1,200
3 gallons of potable water (1: 20), and employs an inception
4 contact time of about ten minutes and a contact period of
5 preferably about five hours. The composition is usually
6 dispensed using a coarse spray for maximum contact and
7 penetration, or by atomization into ambient air so as to
8 neutralize dust and organic material, etc. which may harbor
9 airborne contamination; and, by fumigation. Typically, the
10 product is used on, but not limited to dirt floors, new and used
11 litter, rice hulls, oyster shells, concrete floors, and any other
12 substrate material where animal husbandry is conducted.

13
14 Prior to use, all poultry, animals, feed and portable
15 equipment may be removed from the premises to be treated to
16 assure adequate surface coverage, and all water troughs and feed
17 racks are emptied. Alternatively, since the present composition
18 employs feed grade components, it is not required to remove
19 animals during use, and the premises may be treated in the
20 presence of animals as an ongoing remedy for retarding NH₃ build-
21 up, and/or microorganism development and growth. Surfaces such
22 as floors, ceilings, walls, walkways, etc., of an animal
23 husbandry facility which may include poultry houses, cattle
24 barns, swine facilities, cattle facilities, zoos, and other
25 animal raising facilities are washed and disinfected with a
26 suitable detergent and disinfectant, and allowed to dry.

27

28 The biocide solution of this invention is then sprayed
29 downwardly from the curtains to the floor and thoroughly wetting
30 the desired area to be disinfected. The solution should be
31 allowed to contact the treated surface for a period for at least
32 ten minutes, and the buildings, coops and other closed spaces
33 under treatment should be thoroughly ventilated. Shoe baths
34 containing one inch of biocide solution should be placed at the
35 entrance to a facility and replaced daily.

1 In general, viruses, bacteria, vegetative spores, protozoa
2 and viruses are sterilized by the composition of this invention,
3 and typical organisms which can be neutralized by the composition
4 of this invention in the presence of 50% organic soil and 1,000
5 pm hard water, at dilutions of 1:20, include: vegetative
6 clostridium perfigens, which is known to cause gangrenous
7 dermatitis in poultry. Also included in the above test scheme
8 were tests performed in conformance with A.T.C.C., Fifteenth
9 Edition on the following: staphylococcus aureus A.T.C.C. 6538;
10 salmonella choleraesuis 10708; pseudomonas areuginosa A.T.C.C.
11 15442; salmonella pullorum A.T.C.C. 9184; salmonella enteritidis
12 A.T.C.C. 13076; clostridium perfigens A.T.C.C. 13124 (vegetative
13 cells); salmonella typhimurium A.T.C.C. 14028; escherichia coli
14 A.T.C.C. 25922; pasteurellae multocida A.T.C.C. 43137;
15 aspergillus fumigatus A.T.C.C. 36807; aspergillus glaucus
16 A.T.C.C. 14567; and, infectious bursal disease virus (GUMBORO).

17
18 In addition to the above organisms which are neutralized by
19 the biocide composition of this invention, harmful odors in an
20 animal facility are neutralized; this prevents molds and other
21 harmful microorganisms from becoming airborne.

22
23 Moreover, sterilization is obtained even in the presence of
24 high levels of organic matter including, but not limited to dirt
25 floors, manure and litter. Presently, disinfectants are limited
26 to functioning well in the presence of only about five to ten
27 percent of organic matter, but the composition of this invention
28 functions in the presence of about 50% organic matter and at high
29 levels of water hardness, such as up to about 1,000 ppm.

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1 The composition of this invention provides an inexpensive
2 and reliable biocide for sterilizing animal husbandry surfaces
3 which is effective in high levels of organic material, for
4 effective periods of contact time, and which retains potency for
5 about twelve to eighteen months at ambient temperatures. As
6 mentioned, it is possible that the composition of this invention
7 may also have efficacy as a bovine teat dip.

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1 **CLAIMS:**

2 **1.** A biocide concentrate composition comprising I⁻ and
3 propionic acid.

4
5 **2.** A biocide concentrate composition, comprising: I⁻ and
6 propionic acid for pH control, and for combining with ambient NH₃,
7 to form ammonium propionate, thereby producing residual biocidal
8 activity, and inhibiting or preventing microorganism formation,
9 including mold formation.

10
11 **3.** A biocide concentrate composition for use in hard water,
12 and in the presence or organic material, comprising: HI or I⁻, and
13 propionic acid for pH control, and for combining with ambient NH₃,
14 to form ammonium propionate, thereby producing residual biocidal
15 activity, and inhibiting or preventing microorganism formation,
16 including mold formation.

17
18 **4.** A biocide concentrate composition for use in hard water,
19 and in the presence of organic material, comprising:

20 **a.)** a surfactant agent and the like, for complexing or
21 stabilizing iodine;

22 **b.)** a biocidal amount of iodine complexed by the surfactant
23 agent, or by hydriodic acid, and surfactant;

24 **c.)** propionic acid, and the like for pH control, and for
25 combining with ambient NH₃ to form ammonium propionate, thereby
26 producing residual biocidal activity, and inhibiting
27 microorganism formation, including preventing mold formation;
28 and,

29 **d.)** acidifiers to adjust the composition pH to within the acid
30 range.

31
32 **5.** The composition of Claim 4, adapted for use on animal
33 husbandry surfaces, with hard water up to about 1,000 ppm.

34

35

1 6. The composition of Claim 4, including propylene glycol,
2 and the like for inhibiting dust formation.

3

4 7. A biocide concentrate composition, comprising:

5 a.) a surfactant agent and the like, for complexing or
6 stabilizing iodine and hydriodic acid;

7 b.) a biocidal amount of iodine complexed by the surfactant and
8 hydriodic acid, and for reducing surface tension;

9 c.) propionic acid, and the like for pH control, and for
10 imparting biocidal activity; and,

11 d.) acidifiers to adjust the composition pH to within the acid
12 range.

13

14 8. The composition of Claim 7, including propylene glycol, and
15 the like for solubilizing components of the composition to
16 inhibit dust formation and, providing product stability and
17 increasing penetrability into microorganisms and surfaces.

18

19 9. The composition of Claim 4, in which the surfactant
20 comprises a polyoxyethylene polyoxypropylene block copolymer.

21

22 10. The composition of Claim 4, in which the surfactant is
23 selected from the class consisting of non-ionic, laureth
24 (11 - 16) carboxylic acid; PVP; nonyl phenoxypolyethoxy ethanol;
25 polyethenoxy; and, polyethoxylated polyoxypropylene block
26 copolymer.

27

28 11. The composition of Claim 4, which comprises,
29 iodine: at least about 0.1%; hydriodic acid: at least about
30 0.01%; propionic acid, and the like: at least about 10%;
31 phosphoric acid and/or sulfuric acid, and the like: sufficient to
32 obtain a pH of about -2 to 3; a buffer: at least about 1%; and,
33 propylene glycol, and the like: at least about 5%, all parts by
34 weight.

35

1 12. The composition of Claim 10, which comprises,
2 iodine: about 0.1% - 5%; hydriodic acid: about 0.01% - 2%;
3 propionic acid, and the like: about 10% - 75%; an acid sufficient
4 to obtain a pH of about -2 to 3; a buffer: at least about 1%;
5 and, propylene glycol, and the like: about 5% - 30%, all parts by
6 weight.

7
8 13. The composition of Claim 11, in which the acidifying agent
9 and buffer is an acid selected from the class consisting of
10 citric acid, lactic acid, sorbic acid, maleic acid, fumaric acid
11 and the like, and their salts and esters, and mixtures thereof.

12
13 14. The composition of Claim 11, comprising a water diluent.

14
15 15. The composition of Claim 13, comprising a water diluent of
16 about 20% - 40% by weight of the composition.

17
18 16. The composition of Claim 4, which commences biocidal
19 activity within about ten minutes, provides biocidal activity for
20 about ten minutes to about five hours, and maintains activity in
21 the presence of organic matter.

22
23 17. The composition of Claim 4, in which activity of the
24 composition is maintained in the presence of up to about 50% of
25 organic matter, and 1,000 ppm. of hard water.

26
27 18. The composition of Claim 16, in which the composition has
28 a shelf life of up to about one year to eighteen months, at
29 ambient temperatures.

30
31
32 19. A method for inhibiting or preventing biocidal activity by
33 applying a composition comprising I⁻ and propionic acid.

34
35

1 20. A method for inhibiting or preventing biocidal activity in
2 the presence of organic material, which comprises applying HI or
3 I and propionic acid for pH control, and for combining with
4 ambient NH_3 to form ammonium propionate, thereby producing
5 residual biocidal activity and inhibiting or preventing
6 microorganism formation, including mold formation.

7
8 21. A method for reducing or eliminating biocides from
9 surfaces for animal husbandry, animal feed and food processing
10 operations in the presence of hard water, comprising, applying to
11 the surface a solution containing a surfactant agent, and the
12 like; a biocidal amount of hydriodic acid and complexed or
13 stabilized iodine; propionic acid, and the like for pH control,
14 and for combining with ambient NH_3 to form ammonium propionate,
15 thereby producing residual biocidal activity, and inhibiting or
16 preventing microorganism, including mold formation; and,
17 acidifiers to adjust the composition pH to within the acid range.

18
19 22. The method of Claim 21, in which biocidal activity is
20 commenced within about ten minutes, remains active for about ten
21 minutes to about five hours, and biocidal activity is maintained
22 in the presence of organic matter.

23
24 23. The method of Claim 21, including propylene glycol, and
25 the like for inhibiting dust formation.

26
27 24. The method of Claim 21, including propylene glycol, and
28 the like for dissolving components of the composition, and for
29 inhibiting dust formation.

30
31 25. The method of Claim 21, in which the surfactant comprises
32 a polyoxyethylene polyoxypropylene block copolymer with an HLB of
33 about 1.0 - 7.0.

34

35

1 26. The method of Claim 21, in which the surfactant is
2 selected from the class consisting of polyethenoxy; non-ionic,
3 laureth (11 - 16) carboxylic acid; PVP; nonyl phenoxypolyethoxy
4 ethanol; and, polyethoxylated polyoxypropylene block copolymer.
5

6 27. The method of Claim 21, which comprises applying the
7 solution to the animal husbandry surface in the presence of hard
8 water up to about 1,000 ppm.
9

10 28. The method of Claim 21, in which the solution comprises:
11 iodine: about at least 0.1%; hydriodic acid: at least about
12 0.01%; propionic acid, and the like: at least about 10%;
13 phosphoric acid and/or sulfuric acid, and the like: sufficient to
14 obtain a pH of about -2 to 3; an acidifying agent and buffer:
15 about 0% - 10%; and, propylene glycol, and the like: about
16 0% - 10%, all parts by weight.
17

18 29. The method of Claim 28, in which the solution comprises:
19 iodine: up to about 5%; hydriodic acid: about
20 0.01% - 2%; propionic acid, and the like: about 10% - 75%;
21 phosphoric acid and/or sulfuric acid, and the like: sufficient to
22 obtain a pH of about -2 to 3; a buffer: about 0% - 10%; and,
23 propylene glycol, and the like: about 5% - 30%, all parts by
24 weight.
25

26 30. The method of Claim 28, in which the acidifying agent and
27 buffer is an acid selected from the class consisting of citric
28 acid, lactic acid, maleic acid, fumaric acid, sorbic acid and the
29 like, their salts and mixtures thereof.
30

31 31. The method of Claim 29, in which the composition includes
32 a water diluent.
33
34
35

1 32. The method of Claim 31, in which the water diluent
2 comprises about 20% - 40% by weight of the composition.

3

4 33. The method of Claim 22, in which biocidal activity
5 commences within about ten minutes, provides biocidal activity
6 for about ten minutes to about five hours, and maintains activity
7 in the presence of organic matter.

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9 34. The method of Claim 20, in which the composition has a
10 shelf life of at least one year at ambient temperatures.

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12 35. The method of Claim 21, in which activity of the
13 composition is maintained in the presence of up to about 50% of
14 organic matter.

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16 36. A method for reducing or removing microorganisms from
17 surfaces, comprising applying to the surface a solution
18 containing a surface agent for complexing iodine and hydriodic
19 acid and for reducing surface tension; a biocidal amount of
20 complexed iodine and HI; and, propionic acid and the like for pH
21 control, and for imparting biocidal activity; and, acidifiers to
22 adjust the composition pH to within the acid range.

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24 37. A method for inhibiting or preventing microorganism
25 formation, in the presence of organic material in an animal
26 husbandry environment, which comprises applying propionic acid
27 for pH control, and for combining with ambient NH_3 to form
28 ammonium propionate, thereby producing residual biocidal activity
29 and inhibiting or preventing microorganism formation, including
30 mold formation.

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- 1 38. A bovine teat dip composition, according to Claim 1.
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- 3 39. A bovine teat dip composition, according to Claim 2.
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- 5 40. The method of Claim 19, for use as a bovine teat dip.
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- 7 41. The method of Claim 20, for use as a bovine teat dip.
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1 BIOCIDES COMPOSITION CONTAINING PROPIONIC

2 ACID AND IODINE COMPOUNDS:

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BY: GARY E. GAUMER,

12

BRUCE A. SPIELHOLZ

13

14 ABSTRACT OF THE DISCLOSURE:

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A biodegradable composition having long term phase and composition stability, and a method for producing both short and long period biocide activity, is used for disinfecting animal husbandry surfaces, in the medical and food industry, and the like. The composition contains propionic acid for pH control, and preferably iodine or an iodine containing compound. The propionic acid combines with ambient ammonia, or ammonia containing compounds arising from fermenting litter and manure to form ammonium propionate, which in turn inhibits or prevents microorganism formation, including mold formation. A surfactant which complexes with the iodine may also be used for spraying onto surfaces, and is effective in the presence of a high organic challenge and hard water.

DECLARATION FOR PATENT APPLICATION

DOCKET: 1966

As below named inventor(s): I (We) hereby declare that:

My (our) residence, post office address and citizenship are as stated below, next to my (our) name(s).

I (We) believe that I am (We are) the original, first and sole inventor, (or original, first and joint inventors) of the subject matter which is claimed and for which a patent is sought on the invention, entitled: **"BIOCIDE COMPOSITION CONTAINING**

PROPRIONIC ACID AND IODINE COMPOUNDS"

the specification of which - (check one)

~~XXXXXX~~ is attached hereto,

_____ was filed on _____

as Application Serial No. _____ (if applicable).
and was amended on _____

I (We) hereby state that I (We) have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I (We) acknowledge the duty to disclose information which is material to the patentability of this application in accordance with Title 37, Code of Federal regulations Paragraph 1.56(a).

(We) hereby claim foreign priority benefits under Title 35, United States Code, Paragraph 119 of any foreign patent application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application to which priority is claimed:

Prior Foreign Application(s)	Priority Claimed
(Number) _____ (Country) _____	(Day/Month/Year Filed) _____
(Number) _____ (Country) _____	(Day/Month/Year Filed) _____
(Number) _____ (Country) _____	(Day/Month/Year Filed) _____

I (We) hereby declare the benefit under Title 35, United States Code, Paragraph 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims in this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Paragraph 112, I (We) acknowledge the duty to disclose material information as defined in title 37, Code of Federal Regulations, Paragraph 1.56(a) which occurred between the filing date of the prior application and the national or PCT International filing date of this application:

Application Ser. No. _____	Filing Date _____	patented, pending, abandoned
Application Ser. No. _____	Filing Date _____	patented, pending, abandoned
Application Ser. No. _____	Filing Date _____	patented, pending, abandoned

I (We) hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

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I (We) hereby declare that all statements made herein of my (our) own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, or imprisonment, or both, under Section 1001 of Title 19 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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